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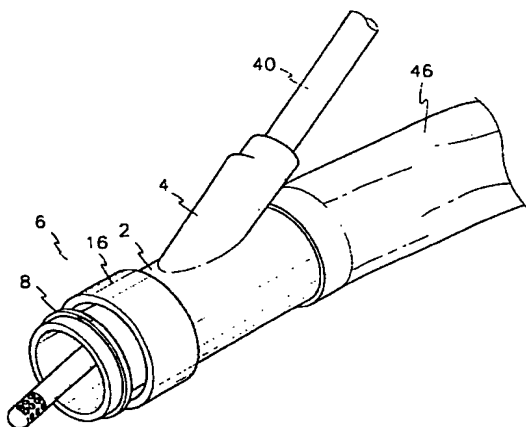
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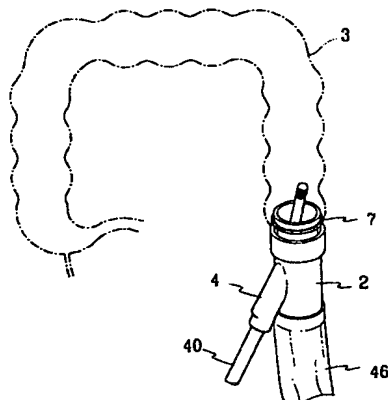
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(54) Title: COLONIC IRRIGATOR



(57) Abstract: Disclosed is a colonic irrigator comprising a main body for inserting into a cutting portion of an intestinal tube, the main body having a hollow portion therein, a branch tube branched off from a side of the main body and communicating with the main body, tightening means for fastening the main body on the cutting portion of the intestinal tube when the main body is inserted into the cutting portion of the intestinal tube, the tightening means being mounted on a front end of the main body, and regurgitation preventing means for preventing regurgitation of contents within the intestinal tube through the branch tube when an irrigating tube or an endoscope is inserted, the regurgitation preventing means being mounted inside the branch tube.



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## COLONIC IRRIGATOR

### FIELD OF THE INVENTION AND PRIOR ART

The present invention relates to a colonic irrigator, and more  
5 particularly, to a colonic irrigator that can irrigate a large intestine before  
performing a surgical operation with respect to an obstructive disease of a left  
colon, such as colon cancer, and allows the use of an endoscope so as to  
make it possible to identify the disease region.

Generally, two-step, three-step and one-step surgical operations are  
10 well known as methods for curing a patient of an obstruction disease of the  
left colon, such as colon cancer.

There are a front colon excision operation and a colonic irrigation in a  
one-step surgical operation. The former has problems in that a patient  
suffers from complications such as an obstruction of the intestine after the  
15 operation, and poor anal sphincter muscle control even after a long time has  
passed. The latter has problems in that a possibility of infection because of  
tearing is higher than with the former and cancer may be formed in the colon.  
The safety of a suture portion is also inferior to the rectum tissue.

Accordingly, although such a surgical operation should be performed  
20 by an expert who has much experience, and the operation time is long, it has  
an advantage of avoiding laparotomy. Therefore, in recent years, such a  
surgical operation has been widely used.

The number of patients having a disease obstructing the left intestine  
from cancer of the rectum and an S-shaped intestine is increased, and the  
25 rectum of the patient is generally excised.

However, such an excision of the rectum may cause complications.  
Therefore, to prevent the complications, it is preferable to irrigate the colon  
during the surgical operation.

Although colonic irrigation prevents the complications, many medical  
30 personnel and much time for the operation is required, and it is impossible to

diagnose cancer formed in an intestinal tube until the surgical operation.

### **PROBLEM TO BE SOLVED BY THE INVENTION**

The present invention has been made in an effort to solve the above  
5 described problems of the prior art, and it is an object of the present invention  
to provide a colonic irrigator that can irrigate a large intestine before  
performing a surgical operation with respect to an obstructive disease of a left  
colon, such as colon cancer, and allows the use of an endoscope so as to  
make it possible to identify the disease region.

10 It is another object of the present invention to provide a colonic  
irrigator that can prevent an irrigating tube or an endoscope from moving  
when the surgical operation is performed using the irrigating tube or the  
endoscope.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

15 FIG. 1 is a perspective view of an irrigator according to the present  
invention;

FIG. 2 is a side sectional view of an irrigator according to the present  
invention;

20 FIG. 3 is a view of a regurgitation preventing valve of an irrigator  
according to an embodiment of the present invention;

FIG. 4 is a view of a regurgitation preventing valve of an irrigator  
according to another embodiment of the present invention;

25 FIG. 5 is a side sectional view of an irrigation tube used in an irrigator  
according to the present invention;

FIG. 6 is a view of an example of use of an irrigator according to the  
present invention; and

FIG. 7 is an enlarged section view of a portion connected to an  
intestinal tube when an irrigator of the present invention is used; and

30 FIG. 8 is a view of another example of use of an irrigator according to

the present invention.

### **DESCRIPTION OF THE INVENTION**

To achieve the above objects, the present invention provides a colonic  
5 irrigator comprising a main body for inserting into a cutting portion of a  
intestinal tube, the main body having a hollow portion therein, a branch tube  
branched off from a side of the main body and communicating with the main  
body, tightening means for fastening the main body on the cutting portion of  
the intestinal tube when the main body is inserted into the cutting portion of  
10 the intestinal tube, the tightening means being mounted on a front end of the  
main body, and regurgitation preventing means for preventing regurgitation of  
contents within the intestinal tube through the branch tube when an irrigating  
tube or an endoscope is inserted, the regurgitation preventing means being  
mounted inside the branch tube.

15 According to a preferred embodiment of the present invention, the  
tightening means comprises a fastening ring for secondary fixing of an  
extension portion of the main body on the cutting portion of the intestinal tube,  
the fastening ring being mounted on the front end of the main body, and a  
fastening nut for primary fixing of an edge of the cutting portion of the  
20 intestinal tube on the extension portion, the fastening nut being spaced away  
from the fastening ring rearward and screw-coupled to the extension portion.

The fastening nut is ring-shaped and provided with a female thread  
engaged with a male thread formed on an outer circumference of the main  
body so as to be movable forward and rearward, the fastening nut being  
25 further provided with a depressing part depressing the edge of the cutting  
portion of the intestinal tube contacting the projection formed on the outer  
circumference of the extension portion.

In addition, the regurgitation preventing means comprises two first  
valves each having a half-cut line, a second valve having a central hole  
30 through which the irrigating tube or the endoscope is inserted, and a thin

membrane provided on a front side of the first valves, the second valve being spaced away from the first valves.

The first valves are made of a silicone material having a predetermined elastic force, and portions of the first valves are defined in that  
5 when the irrigating tube or the endoscope selectively passes through the half-cut lines they tightly contact the outer circumference of the irrigating tube or the endoscope, thereby preventing the regurgitation of the contents of the intestinal tube.

The colonic irrigator may further comprise fixing means having a  
10 connector for fixing the first valves in the branch tube and a guide for fixing the second valve in the connector and supporting the irrigating tube or the endoscope to prevent movement.

An anti-infection tube is mounted enclosing the branch tube.

A colonic irrigator according to a preferred embodiment of the present  
15 invention will be described hereinafter with reference to the accompanying drawings.

FIG. 1 is a perspective view of a colonic irrigator according to the present invention, and FIG. 2 is a side sectional view of the colonic irrigator depicted in FIG. 1. The irrigator comprises a cylindrical main body 2, a branch  
20 tube 4 extended rearward from the main body 2 at a predetermined angle, and tightening means for tightening the intestinal tube 3 (see FIG. 6) so as to prevent contents from flowing out of the intestinal tube 3, the tightening means being provided on a front end of the main body 2.

An extension portion 10 is extended from a front portion of the main  
25 body 2 and inserted into the intestinal tube 3 through a cutting portion 5 of the intestinal tube 3. A drainage tube 46 for exhausting contents and irrigation liquid out of the intestinal tube 3 is coupled to a rear portion of the main body 2.

On an outer circumference of the extension portion 10, the intestine  
30 tube 3 is fixed by a fastening ring 8. The extension portion 10 is provided with

a projection 12 for preventing displacement when the intestinal tube 3 is fixed thereon.

The fastening ring 8 tightly fixes the intestine tube 3 on the outer circumference of the extension portion 10 by depressing an outer portion of the intestine tube 3 when the cutting portion 5 of the intestine tube 3 is placed on the extension portion 10.

The tightening means 6 is provided on a rear side of the fastening ring 9. The tightening means 6 comprises a male thread portion 14 formed on an outer circumference of the main body 2 and a fastening nut 16 engaged with the male thread portion 14.

The fastening nut 16 is ring-shaped and provided with a female thread. The fastening nut 16 is provided with a depressing portion 19 for depressing an outer circumference of a projection 18 formed on a border of the tightening means 6 and the extension portion 10.

Accordingly, as shown in FIG. 7, when the fastening nut 16 is rotated, it is moved forward to depress the cutting portion 5 of the intestinal tube 3 placed on the extension portion 10.

As a result, the cutting portion 5 of the intestinal tube 3 is primarily fastened by the fastening nut 16, and secondarily depressed by the fastening ring 8.

In addition, as the branch tube 4 is connected to the main body to communicate therewith, when an irrigating tube or an endoscope 40 is inserted through the branch tube 4, the irrigating tube or the endoscope 40 can reach the intestinal tube 3 connected to the main body 2.

As described above, the branch tube 4 is inclined rearwards with respect to the main body 2 so that the irrigating tube or the endoscope 40 can be smoothly introduced into the main body. The branch tube 4 can be integrally formed with the main body 2 or can be specially made and then assembled with the main body 2.

So as to prevent the displacement of the irrigating tube or the

endoscope 40 when in a state where the irrigating tube or the endoscope 40 is inserted into the branch tube 4, a flange 20 is formed extending inward of the branch tube 4.

The inward flange 20 has a diameter that can prevent the endoscope  
5 40 or the irrigating tube from moving. A thin membrane 29 is provided on an outer side of the inward flange 20. The thin membrane 29 prevents the contents from exhausting out of the intestinal tube 3 through the branch tube before regurgitating means is mounted. The thin membrane 29 also prevents the branch tube 4 from being contaminated. The thin membrane 29  
10 is designed to be broken when the irrigating tube or the endoscope 40 is introduced into the branch tube 4.

Regurgitating means 32 is provided at an outer side of the thin membrane 29 to prevent the contents within the main body 2 from exhausting. The regurgitating means is formed at two places.

15 The regurgitating means is shown in FIGS. 3 and 4. That is, the regurgitating means 32 comprises first and second regurgitating members 22 and 28. As shown in FIG. 3, the first regurgitating member 22 includes two valve bodies 22a and 22b that are made of silicone material. Each center portion of the valve bodies 22a and 22b is provided with a half-cut line 22c  
20 through which the irrigating tube or the endoscope 40 is introduced.

The cut line 22c is Y-shaped, which can be broken along its shape. The valve bodies 22a and 22b are stacked on one another such that the Y-shapes of the cut lines 22c are symmetrically disposed. Accordingly, when the endoscope or the irrigating tube 40 is introduced, the broken  
25 portions of the valve bodies 22a and 22b can tightly contact the outer circumference of the endoscope or the irrigating tube 40, thereby preventing the contents from exhausting.

In addition, the second regurgitating member 28 is formed of a doughnut-shaped single valve body having a hole 30 through which the  
30 irrigating tube or the endoscope 40 can be introduced.



The first and second regurgitating members 22 and 28 are fixed on the branch tube 4 by fixing means including a connector 33 and a guide 34.

That is, the first regurgitating member 22 is connected on an end portion of the branch tube 4 by the connector 33, which is integrally coupled to the end portion of the branch tube 4 through a fitting or screw-coupling manner. At this point, the connector 33 couples the first regurgitating member 22 inside the branch tube 4 by depressing the same.

In addition, the second regurgitating member 28 is coupled to the connector by the guide 34, which is integrally coupled to the end portion of the connector through a fitting or screw-coupling manner.

An inner diameter of the guide 34 is sized such that the irrigating tube or the endoscope 40 cannot be moved by the outer force.

Furthermore, An anti-infection tube 49 is provided on an outer side of the branch tube 4. The anti-infection tube 49 prevents the irrigating tube or the endoscope 40 from being contaminated when the endoscope 40 is introduced through the branch tube 4. The anti-infection tube 49 also prevents the contents within the intestinal tube 3 from exhausting.

FIG. 6 shows a sectional view of the irrigating tube. As shown in the drawing, an end portion of the irrigating tube 40 includes a cover 24 and an inner tube 26. The cover 24 and the inner tube 26 are provided with a plurality of holes through which the irrigation liquid can be quickly injected and the liquid remained in the intestinal tube can be absorbed, if required.

A utilizing method of the colonic irrigator according to a preferable embodiment of the present invention will be described hereinafter with reference to the accompanying drawings.

As shown in FIGS. 2 through 8, when using the irrigator, a portion of the intestinal tube 3 in which the irrigator is inserted is first selected. Then, by pressing the selected portion, the contents are moved to another portion of the intestinal tube 3, then a forceps is used to minimize the leakage of contents.

Before inserting the irrigator, the shrunken intestine tube 3 is sealed in a pouch-shape and cut in a circular-shape. Although liquid may leak during the cutting operation, the leaked liquid can be removed using an absorber.

The extension portion 10 of the main body 2 is inserted into the  
5 intestinal tube 3 through the cutting portion 5 such that the cutting portion contacts the outer circumference of the extension portion 10. In this state, The fastening nut 16 is rotated to depress the edge of the cutting portion 5 while moving forward. Then, the fastening ring 8 is fastened to fix the cutting  
10 portion 5 on the extension portion 10 of the main body 2 such that the edge of the cutting portion 5 is placed on the projection 18. In the above state, when the forceps are released, the contents within the intestine are exhausted through the main body and a drainage tube by pressing the intestinal tube 3, and then collected in a special collecting container.

While exhausting the contents, an irrigating liquid is injected through  
15 an irrigating tube 40. That is, the irrigating tube 40 is inserted into the main body through the regurgitating means 32 mounted on the branch tube 4. At this point, the irrigating tube 40 is guided by the guide 34 so that its movement can be prevented. Then, the irrigating tube 40 bursts the thin membrane 29 while passing through the hole 30 of the second regurgitating member 28 and  
20 the cutting lines 22c of the first regurgitating member 22. At this point, since the cutting portions broken along the cutting lines 22c tightly contact the outer circumference of the irrigating tube 40, leakage of the contents through the branch tube 4 can be prevented.

The irrigating liquid is continuously injected until the irrigating tube 40  
25 reaches the appendix through the holes 41 formed on the end portion of the irrigating tube 40.

By doing the above, the inside of the intestinal tube 3 is cleansed. The amount of the irrigating liquid used for cleansing the inside of the intestinal tube 3 is about 10,000-20,000 cc. When the cleansing liquid is exhausted,  
30 the irrigating tube 40 is removed.

After the above, the endoscope 40 is inserted through the branch tube 4 to examine for other diseases such as a cancer. At this point, since the branch tube 4 is covered with the anti-infection tube 49, the branch tube 4 is not contaminated during the insertion and removal of the endoscope 40.

5 When it is determined that there is another disease as a result of the endoscope examination, a surgical operation is performed with respect to the examined disease after cutting the intestinal tube 3. At this point, since there are no contents within the intestine, the enlarged operation view can be obtained, making it easy to perform the operation.

10 In addition, as shown in FIG. 9, the colonic irrigator can be used by being inserted into not only the side of the intestinal tube 3 but also the cutting portion 7 of the intestinal tube 3.

That is, after inserting the colonic irrigator into the lower cutting portion 7 of the intestinal tube 3, the irrigating tube or the endoscope 40 is inserted  
15 into the intestinal tube 3 through the branch tube and the main body, after which the contents are exhausted through the exhausting tube 46.

### **EFFECT OF THE INVENTION**

As described above, the colonic irrigator according to the present  
20 invention has advantages in that it can be used to quickly operate on a patient having a chronic or acute disease with an obstructing problem of a left colon without contamination and to examine the intestinal tube using the endoscope.

In addition, when the irrigating tube or the endoscope is inserted  
25 through the branch tube of the colonic irrigator, regurgitation can be prevented by using two regurgitating members.

By mounting the guide on the branch tube, the movement of the irrigating tube or the endoscope can be prevented, improving the accuracy of the operation.

30 By providing the thin membrane and the anti-infection tube on the

inner and outer portions of the branch tube, the contamination of the colonic irrigator can be prevented.

Although preferred embodiments of the present invention have been described in detail hereinabove, it should be clearly understood that many variations and/or modifications of the basic inventive concepts herein taught  
5 which may appear to those skilled in the present art will still fall within the spirit and scope of the present invention, as defined in the appended claims.

**WHAT IS CLAIMED IS:**

1. A colonic irrigator comprising:

a main body for inserting into a cutting portion of an intestinal tube, the main body having a hollow portion therein;

5 a branch tube branched off from a side of the main body and communicating with the main body;

tightening means for fastening the main body on the cutting portion of the intestinal tube when the main body is inserted into the cutting portion of the intestinal tube, the tightening means being mounted on a front end of the  
10 main body; and

regurgitation preventing means for preventing regurgitation of contents within the intestinal tube through the branch tube when an irrigating tube or an endoscope is inserted, the regurgitation preventing means being mounted inside the branch tube.

15 2. A colonic irrigator of claim 1 wherein the tightening means comprises a fastening ring for secondary fixing an extension portion of the main body on the cutting portion of the intestinal tube, the fastening ring being mounted on the front end of the main body and a fastening nut for primary fixing an edge of the cutting portion of the intestinal tube on the extension  
20 portion, the fastening nut being spaced away from the fastening ring rearward and screw-coupled to the extension portion.

3. A colonic irrigator of claim 2 wherein the fastening nut is ring-shaped and provided with a female thread engaged with a male thread formed on an outer circumference of the main body so as to be movable  
25 forward and rearward, the fastening nut being further provided with a depressing part depressing the edge of the cutting portion of the intestinal tube contacting the projection formed on the outer circumference of the extension portion.

4. A colonic irrigator of claim 1 wherein the regurgitation  
30 preventing means comprises two first valves each having a half-cut line, a

second valve having a central hole through which the irrigating tube or the endoscope is inserted, and a thin membrane provided on a front side of the first valves, the second valve being spaced away from the first valve.

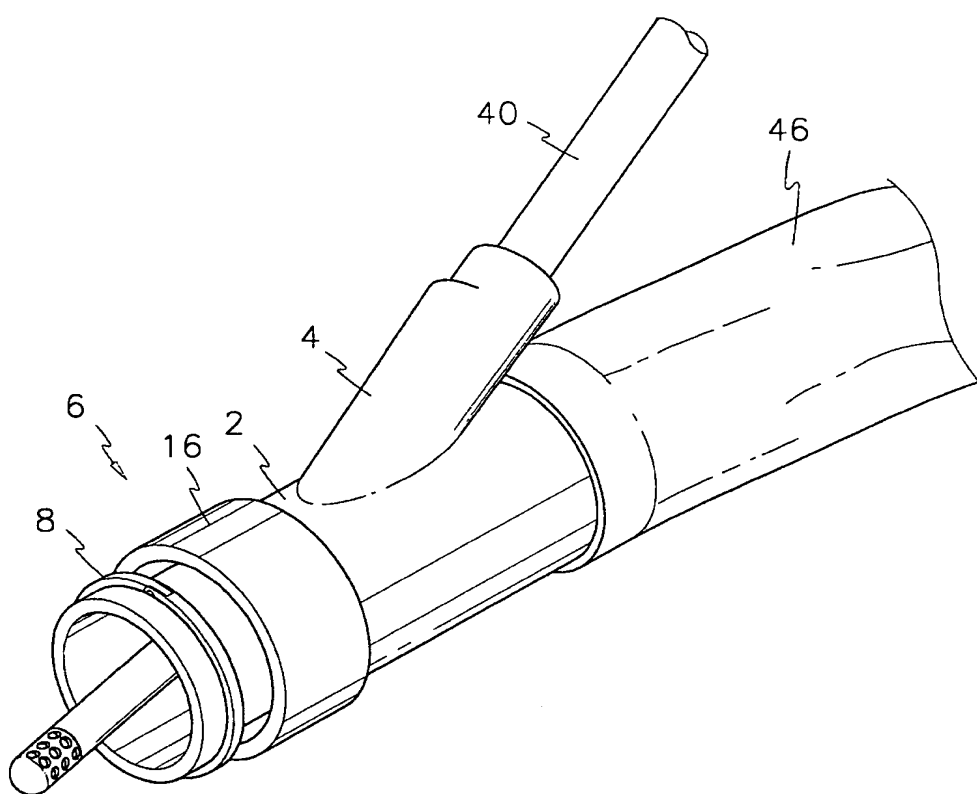
5        5.        A colonic irrigator of claim 1 wherein each of the first valves is made of a silicone material having a predetermined elastic force, portions of the first valves defined in that when the irrigating tube or the endoscope selectively passes through the half-cut lines they tightly contact the outer circumference of the irrigating tube or the endoscope, thereby preventing the regurgitation of the contents with the intestinal tube.

10        6.        A colonic irrigator of claim 5 further comprising fixing means having a connector for fixing the first valves in the branch tube and a guide for fixing the second valve in the connector and supporting the irrigating tube or the endoscope to prevent the movement.

15        7.        A colonic irrigator of claim 1 wherein An anti-infection tube is mounted enclosing the branch tube.

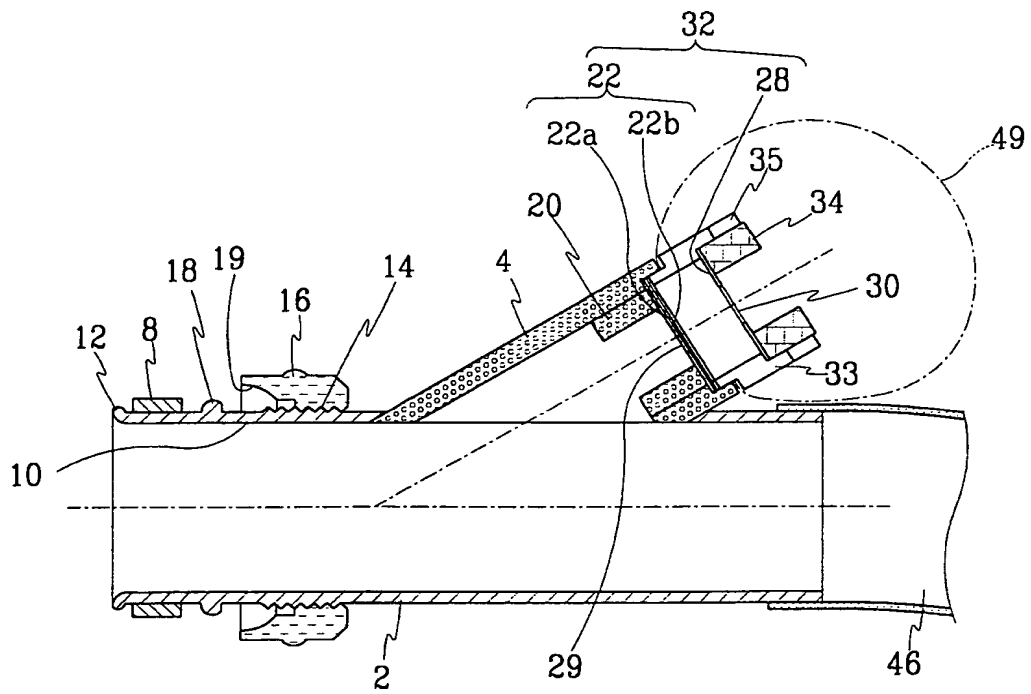
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FIG.1



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FIG.2





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FIG.3

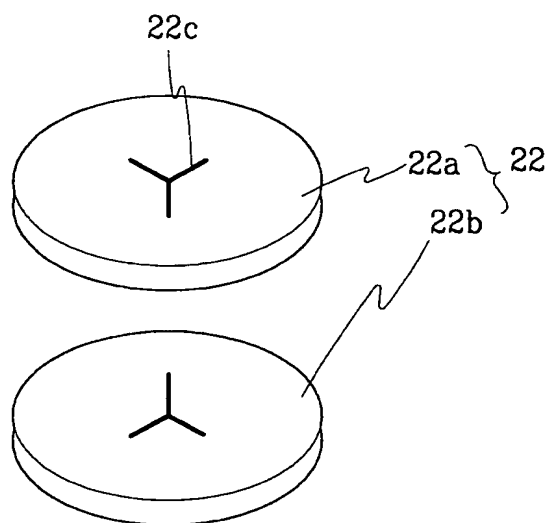
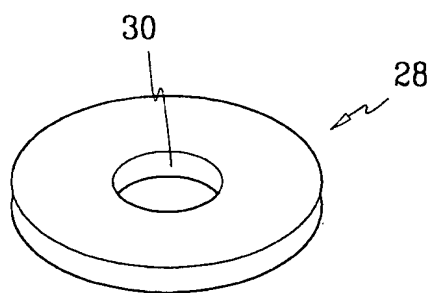


FIG.4



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FIG.5

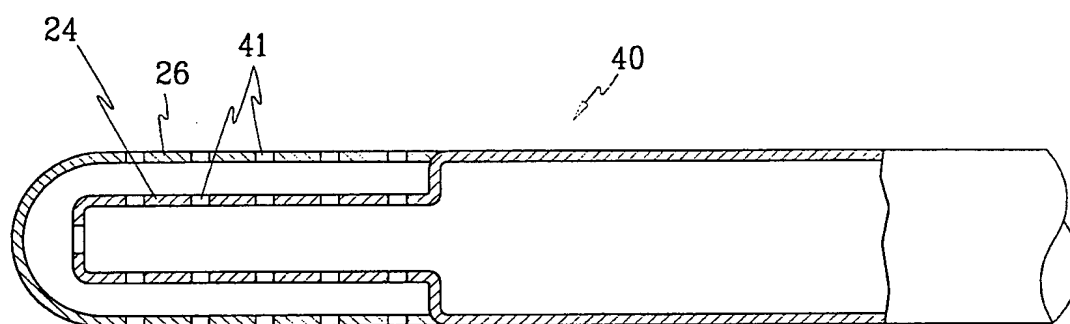
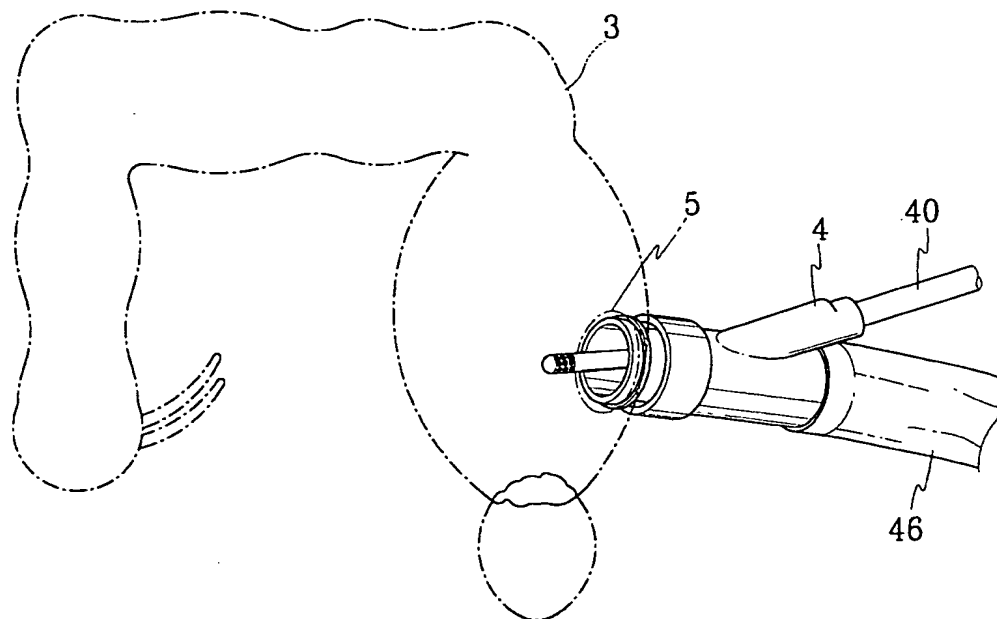
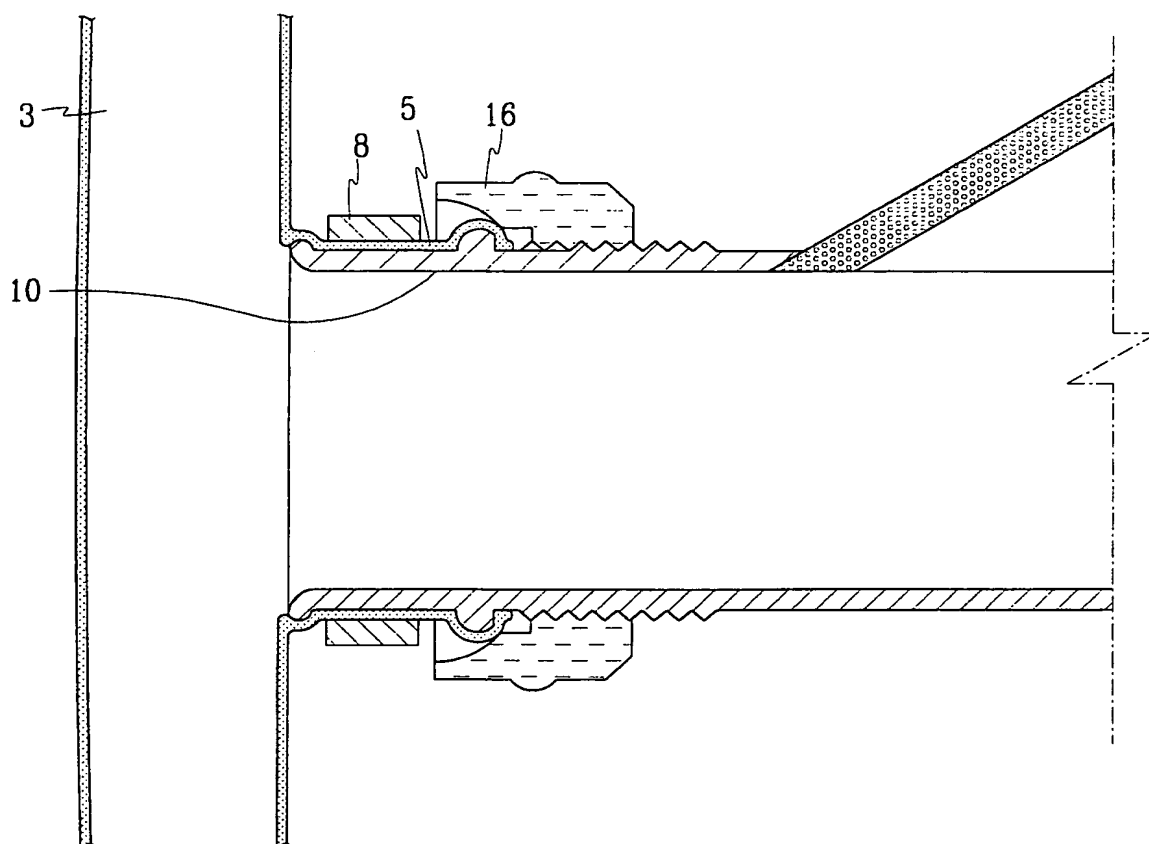


FIG.6



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FIG. 7



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FIG.8

